

The varices or alternate swellings, characteristic of *Tylostoma*, are present, but not so conspicuous upon this example as they are upon some species of the genus, especially upon *T. mutabilis* Gabb, another Mexican Cretaceous form; but they are quite as conspicuous as they are shown to be in the published figures of Sharpe's type species, *T. torrubia*. These varices or swellings are more apparent in our example by an apical than by a lateral view of it, but their presence is indicated in fig. 2 upon the ultimate and penultimate whorls.

Although size cannot generally be relied upon as a specific character, the extraordinary dimensions of this shell separate it clearly from any other known form with which it might be otherwise in danger of being confounded. The only fossil species which resemble it, or even approximately approach it in size, are the *Natica pedernalis* and *N. pre-grandis* of Roemer, from the Cretaceous of Texas; but both these species evidently belong to a group that is now generally referred to *Lunatia*, or *Euspira*; and the largest known examples of either of these forms have scarcely more than half the dimensions of the example here described.

DESCRIPTION OF TWO NEW SPECIES OF SEBASTICHTHYS (SEBASTICHTHYS ENTOMELAS AND SEBASTICHTHYS RHODOCHLORIS), FROM MONTEREY BAY, CALIFORNIA.

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Sebastichthys entomelas sp. nov.

Allied to *S. ovalis* (Ayres).

Body oblong, rather elongate, the back regularly but not strongly arched, contracted to a rather slender caudal peduncle. Head moderate, the profile less steep than in related species, but the tip of the snout blunter than in *ovalis*. Mouth small, the short maxillary extending to below the middle of the eye. Lower jaw projecting, its tip entering the profile, but considerably less protruding than in *ovalis*. Palatine teeth few.

Preorbital very narrow, without spine. Eye rather large, about 4 in length of head, less than the interorbital space, which is strongly convex, especially in its middle part.

Nasal spines minute. Preocular spine broad, triangular, rather prominent, more conspicuous than in *melaneps*, but much less so than in *ovalis*. Supraocular ridge little developed, its spine minute, sharp, concealed by the scales. Postocular spine present, minute, similarly concealed. No tympanic spine. Occipital ridges scarcely developed, concealed by the scales, without distinct spine at tip. In *ovalis* all these spines, though small, are distinct. In *flavidus* there is no trace of any spines on the cranium, and the ridges are little developed.

Preopercular spines rather small, directed backwards, the two lower obsolete. Opercular spines small, two suprascapular spines. Scales on

top and sides of head very small, present on maxillary, mandible, pre-orbital, and snout.

Scales on body small, in about 65 transverse series.

Gill-rakers numerous, long and slender, their length about half the diameter of the eye.

Dorsal spines very low and slender, the fin moderately emarginate, the membrane joining the last spine at about two-fifths its height. Soft dorsal long and low, the soft rays about as high as the highest spines, a little more than one-third the length of the head. Caudal forked. Anal low, its second spine stronger than third, but scarcely higher, less than two-thirds the height of the first soft ray. Pectoral fins moderate, not reaching vent, their tips beyond tips of ventrals, their base $3\frac{1}{2}$ in length of head.

Fin rays: D. XIII, 15; A. III, 8.

Color rather dull olive-green. Sides with obscure round rusty spots. Belly, lips, and lower parts tinged with creamy. Obscure light and dark shades across cheeks. Traces of two or three obscure dark vertical bars. Dorsal dusky, with reddish shades. Caudal dusky, the rays olive. Other fins dusky, with creamy reddish at base. Lower half of pectoral distinctly reddish.

Peritoneum *jet-black*.

This species is known to us from five specimens taken in deep water outside of Monterey Bay, in company with *S. ovalis*, *rubrinectus*, *elongatus*, etc. It is known to the Portuguese fishermen as "*Buda*." Its relations are probably most intimate with *ovalis*, which differs in the following respects:

Ovalis is much deeper and more oval in form, with the back considerably more elevated, and the profile much more steep, the lower jaw more protruding. The mouth reaches to the posterior edge of the pupil. The preocular ridge is very strong, forming a large triangular protuberance ending in a spine; small supraocular, postocular, tympanic, and occipital spines are present, the tympanic spine very minute, but constant. The dorsal fin is very low, the *notch between the spinous and soft parts extremely shallow*, the membrane joining the last spine at more than two-thirds its height, the height of the spinous and soft portions about equal. The *second anal spine* is considerably the longest and strongest, scarcely lower than the soft rays. The pectoral fins are long, reaching to the vent.

Anal rays, III, 7, or III, 8.

The color of this species when adult is olivaceous, strongly tinged with pale creamy red, especially below. The membrane of both dorsals are covered with many small round black spots. Some of these are usually present on the body. The upper fins are greenish, the lower more yellowish, and most of them are more or less dusky-edged. Caudal fin rather dark.

Peritoneum black.

The remaining species of this type, *melanops*, *simulans*, and *flavidus*, differ in the absence of any distinct spines on the cranium, as well as in color, form, and other peculiarities. *Melanops* has the preocular ridge considerably developed, and occasionally ending in a spine. The others have this ridge obsolete. The mouth in *simulans* and *flavidus* is considerably larger than in the other species. In *melanops* and *simulans* the fins are slaty black, like the body. In *flavidus* they are olivaceous, the caudal being distinctly brownish yellow (hence the popular name of Yellow-tail). The peritoneum in *flavidus* is pure white, in *melanops* somewhat dusky.

Sebastichthys rhodochloris sp. nov.

Allied to *S. rosaceus* (Girard).

Body oblong, more elongate than in *rosaceus*, the back less elevated, the profile less steep. Mouth comparatively large, but rather smaller than in *rosaceus*, the maxillary not reaching beyond posterior border of pupil. Jaws about equal in the closed mouth, the lower with a small symphyseal prominence. Preorbital narrow, with two bluntnish projections. Eye very large, longer than the long snout, $3\frac{1}{2}$ in head.

Spinous ridges on top of head very high, slender, and sharp, more elevated than in *rosaceus*, *chlorostictus*, and *constellatus*, and sharper. Nasal, preocular, supraocular, postocular, tympanic, and occipital spines present, as in most of the red species. Supraocular ridge long and prominent. Postocular and tympanic spines close behind it, sharp and large. Interorbital space very narrow, its width even posteriorly less than length of supraocular spine (in *rosaceus* considerably more). Interorbital space with two longitudinal ridges, sharp and conspicuous, not covered by the scales, the very narrow interspace between them strongly concave, the spinous ridges strongly divergent behind.

Preopercular spines sharp, directed backward, the three upper long and pointed, more developed than in *rosaceus*, less radiating than in *chlorostictus*. Two sharp suprascapular spines. Opercular spines short and sharp.

Gill-rakers about as in *rosaceus* and *chlorostictus*, moderately long and slender, much shorter than in *cralis* or *pinniger*, but longer than in *nebulosus* and *ruber*, the longest gill-raker about one-fourth the diameter of the eye.

Dorsal fin still lower than in *rosaceus*, the membranes little emarginate, the longest spine about $2\frac{3}{8}$ in head (in *rosaceus* $2\frac{1}{2}$). Emargination of dorsal moderate. Soft rays low, the highest about equal to the highest spine. Caudal fin slightly emarginate.

Second anal spine proportionately longer than in any other of our species, very strong, curved, its length about equal to that of the maxillary or the base of the soft dorsal, or about half the length of the head. It is higher than the soft rays of the anal. Pectoral fins reaching past tips of the ventrals nearly to the anal.

D. XIII, 14; A. III, 6.

Scales moderate, in 58 transverse series, the small accessory scales very numerous.

Ground-color bright clear rose-red, *without any trace of purplish*. Region above the lateral line with much deep green, in the form of reticulating streaks. Below the lateral line the green gives place to bright golden yellow, which is similarly mixed with the red. Top of head with cross-bands of green and red, green streaks radiating from the eye, one to snout, one along maxillary, three across cheeks and opercles, and one across temporal region.

Four bright pale pink spots on the sides of the back, arranged as in *rosaceus*, *constellatus*, and *chlorostictus*; the color brighter than in these species, and entirely devoid of the purplish ring which is found in *rosaceus*; one spot is under the fourth dorsal spine, one near the lateral line under eighth dorsal spine, one under junction of spinous and soft rays, and one under the last soft ray. The first and third of these spots are each surrounded by a distinct ring of green. Another pink spot on the tip of the opercle. A distinct pale area behind eye. Dorsal with the rays red and the membranes olive-green. Caudal and anal with the rays red and the membranes golden. Pectorals red, dashed with olive. Ventrals red. Under parts of head and the inside of the mouth pale red, unspotted.

In *S. rosaceus* the red on head above, and around the pink spots on the sides, is distinctly purple-red. The yellow or olive on the back and sides blends with the red instead of forming distinct reticulations, and there is little if any green on the back or fins. The lateral line is clear red, usually not crossed by the olive marks.

Sebastichthys rhodochloris occurs in abundance in the deep waters of the Bay of Monterey. It is a small fish, like *S. rosaceus*, and rarely reaches a weight of more than a pound. It is known to the fishermen of Monterey by the name of "Fly-fish," *S. rosaceus* being called "Corsair."

One fisherman who procured a number of them for us, on being told that his "Fly-fish" was very much like the "Corsair," summed up the relationships of the two as follows: "You bet it is like it, but it is a different kind of fish."

The following species of "rock-fish" were obtained by us in Monterey Bay. The names used by the fishermen of Monterey are appended. Most of these are evidently names in use for other species at the Azores, transferred to species of Californian waters:

- S. paucispinis* Meron, Tom-cod, Jack-fish.
- S. flavidus* Yellow-tail.
- S. simulans*
- S. melanops*.....Pesce Pretre (Priest-fish, from its color).
- S. entomelas*Buda.
- S. ovalis*.....Vinva (Widow).

<i>S. atrovirens</i>	Garrupa (Vera).
<i>S. pinniger</i>	Fliaum.
<i>S. miniatus</i>	Rasher.
<i>S. auriculatus</i>	
<i>S. proriger</i>	
<i>S. elongatus</i>	Reña.
<i>S. vexillaris</i>	Yellow Garrupa.
<i>S. chlorostictus</i>	Pesce Vermiglia.
<i>S. rhodochloris</i>	Fly-fish.
<i>S. rosaceus</i>	Corsair.
<i>S. constellatus</i>	Bagre.
<i>S. ruber</i>	Tambor.
<i>S. rubrivinctus</i>	Spanish Flag.
<i>S. rostelliger</i>	Garrupa.
<i>S. maliger</i>	
<i>S. carnatus</i>	Red Garrupa.
<i>S. nebulosus</i>	
<i>S. fasciolaris</i>	Spotted Garrupa.
<i>S. serriceps</i>	Tree-fish.

Table of measurements.

	<i>Entomelas</i> (Monterey).	<i>Ovalis</i> (Monterey).	<i>Melanops</i> (Sta. Barbara).	<i>Flavidus</i> (Monterey).	<i>Rhodochloris</i> (Monterey).	<i>Rosaceus</i> (Monterey).
Extreme length, inches.....	12	13	12.25	14.90	9.10	8.85
Length to base caudal, inches = 100.....	10	11	10.10	12.05	7.90	7.55
Body:						
Greatest height.....	29.5	35	36	33.8	34	36
Least height.....	9	9	11	11.5	9	-----
Head:						
Length.....	30.5	32	31.6	36.5	39.5	35
Diameter of eye.....	7.8	8	7.3	8.5	12	10
Maxillary.....	12.5	11.5	13	16	18.5	19.5
Width interorbital area.....	8.7	8	9.5	9.3	5	6
Longest gill-rakers.....	5	5	3.8	5	3	3.5
Supraocular spine.....	-----	-----	-----	-----	8	5
Occipital spine.....	-----	-----	-----	-----	7.5	7
Dorsal:						
Height highest spine ...	12	13	11.3	13.7	15	16
Highest soft ray.....	12.5	12	15	17	13	15.5
Height 12th spine.....	4	8	-----	-----	-----	-----
Height membrane 12th spine.....	3.5	5.5	-----	-----	-----	-----
Anal:						
Second spine.....	9.5	12.5	8	9.5	19	17
Third spine.....	9	11.5	10	10.7	13.5	15
Longest ray.....	14	14.5	17.5	20	17	19
Caudal:						
Middle rays.....	14	14.5	17	19.3	-----	-----
External rays.....	21	19	23	22.5	-----	-----
Pectoral:						
Width base.....	8	9	29	27	9	9.5
Length.....	27	31	29	27	27	27.5
Ventral, length.....	18	20	20.5	22.5	21.5	20

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